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Scientists identify potential marker for early detection of neuro-degenerative diseases

05 September 2022 | News

Exploring how the hydration of proteins gets altered as liquid-liquid phase separation sets in



Scientists at Kolkata-based SN Bose National Centre for Basic Sciences, an autonomous institute of the Department of Science and Technology (DST), have explored how the hydration of proteins, gets altered as liquid-liquid phase separation (LLPS) sets in.

The researchers have spotted the crucial role of water in LLPS which holds the key to neuro-degenerative diseases. They found that some excipients or inactive substance that serves as the vehicle or medium for a drug or other active substance like sucrose can stabilise LLPS while some can inhibit it. Thus aggregation process of these diseases could be modulated by altering water network dynamics using these excipients.

In a paper published in *J. Phys. Chem. Lett,* the scientists under the leadership of Prof Rajib Kumar Mitra, examined four excipients — arginine, glucose, ubiquitin, and bovine serum albumin. Some excipients like sucrose were found to stabilise the LLPS process while Bovine Serum Albumen (BSA) was found to inhibit the process.

Their experiments have identified that both protein and excipient hydration is important in regulating the LLPS process. Monitoring a change in hydration could therefore act as a potential marker for early and easy detection of LLPS onset.